AMENDED CLAIMS
[Received by the International Bureau on January 4th 2006 (04.01.2006);
claims 1-13 modified, claims 14-21 added]

CLAIMS

1) Simple product consisting in samples containing at least one kind of isomer nuclides characterized in that groups of two or several excited nuclei of the aforesaid nuclides of the aforesaid samples, are entangled between them and are distributed in whole or in part of the aforesaid samples, called thereafter by convention “entangled” samples, the aforementioned “entangled” samples being able to be separated in space and presenting quantum couplings between some of the excited nuclei of the aforesaid nuclides contained in these separate samples.

2) Simple product according to claim 1 characterized in that it includes “entangled” samples containing excited nuclei of at least one kind of isomer nuclides having at least one metastable state half-life of a duration from one microsecond to 50 years, for example Niobium (93Nb41m), Cadmium (111Cd48m), Cadmium (113Cd48m), Cesium (135Ce55m), Indium (115In49m), Tin (117Sn50m), Tin (119Sn50m), Tellurium (125Te52m), Xenon (129Xe54m), Xenon (131Xe54m), Hafnium (178Hf72m), Hafnium (179Hf72m), Iridium (193Ir77m), or Platinum (195Pt78m), the aforementioned “entangled” samples being able to be moved over large distances and to wait long periods, if their half-life allows it, while being always likely to be deexcited.

3) Simple product according to claim 1 characterized in that it includes “entangled” samples, in any physical form or chemical form, for example the form of solids in sheet or powder, or the form of fluids or gases (for example case of Xenon), which contain a proportion of one or several isotopes, for example Niobium (93Nb41m), Cadmium (111Cd48m), Cadmium (113Cd48m), Cesium (135Ce55m), Indium (115In49m), Tin (117Sn50m), Tin (119Sn50m), Tellurium (125Te52m), Xenon (129Xe54m), Xenon (131Xe54m), Hafnium (178Hf72m), Hafnium (179Hf72m), Iridium (193Ir77m), Platinum (195Pt78m), or in the form of alloys, mixtures, or in the form of chemical compounds incorporating a proportion of one or several of the aforesaid isotopes.

4) Simple product according to claim 1 characterized in that it includes “entangled” samples, of which one at least is in a physical and/or chemical form different from the other “entangled” samples, for example one in powder and the other in sheet, or one in the form of a solid, or in the form of powder or gas and the other incorporated in injectable carrying molecules for example, in salts or molecules put in solution.

5) Manufacturing process of the simple product according to the claim 1 in which one uses amongst other things:

- at least a kind of isomer nuclide,
- irradiation by gamma rays,

characterized in that the following steps are carried out:

- one prepares together samples containing nuclei of at least an isomer nuclide having at least one metastable state, by irradiation by means of gamma rays at least partly entangled, of a sufficient energy to excite certain of the aforesaid nuclei of the isomer nuclide in at least a metastable state, the said entangled gamma rays being for example generated, either by a source of gamma rays emitted in a cascade, or by a generator of gamma rays coming from the Bremsstrahlung of accelerated particles, the said groups of gamma rays, when they are entangled, exciting the corresponding said nuclei of the said isomer nuclide distributed in the said samples irradiated together, qualified in the continuation by convention as “entangled” samples of the aforesaid simple product.

6) Method according to claim 5 characterized in that one uses “entangled” samples of which one at least has undergone a physical and / or a chemical transformation after the irradiation.

7) Use of the simple product according to anyone of claims 1, 2, 3 or 4 to control a remote deexcitation by employing isomer nuclides, in which one uses amongst other things:

- at least one kind of isomer nuclide,
- the stimulation of the deexcitation by X-ray or gamma irradiation of at least one kind

of isomer nuclides,

- either the detection of gamma radiation measuring at least one line characteristic of the isomer nuclides, or the gamma radiation as such, or a combination of these exploitations,

characterized in that the following steps are carried out:

- one separates in space whole or part of the “entangled” samples of the aforesaid simple product containing excited nuclei of the aforesaid nuclide presenting some quantum couplings, certain of the aforesaid excited nuclei of the aforesaid nuclide being distributed on some of these samples, and presenting quantum couplings,
- one exploits quantum couplings between excited nuclei of certain “entangled” samples of the aforesaid simple product, independently of the distances, mediums separating them and independently from the mediums in which these “entangled” samples are placed:
  - o by causing at least a modulated stimulation of the deexcitation by X-ray or gamma irradiation, for example obtained by means of a source of Iron 55, within at least one of the aforesaid “entangled” samples, qualified as “entangled” “master” sample, the aforementioned modulated stimulation inducing, by means of the quantum couplings, a remote deexcitation of the other “entangled” samples, qualified as “entangled” “slaves” samples; the aforesaid modulated stimulation applied to the “master” sample characterizing at least one information or at least one control to be transmitted,
  - o and, either by determining, either at least one detection of information, or at least one detection of control, by means of at least one measurement made with a detector of gamma radiation, of at least one additional modulated deexcitation on at least one line characteristic of at least one isomer nuclide contained in at least one of the other “entangled” “slave” samples, or by using the gamma radiation resulting from the additional modulated deexcitation from at least one isomer nuclide contained in at least one of the other “entangled” “slave” samples, as a remote control, or by using at least one of the other “entangled” “slave” samples,

as a product of which the irradiation is operated by remote control to remotely irradiate the environment of the aforesaid “entangled” “slave” sample, or a combination of these exploitations.

8) Use according to claim 7 characterized in that one employs “entangled” samples containing excited nuclei of at least two isomer nuclides, whose gamma response of at least one “entangled” “slave” sample either is measured, or used to irradiate its environment.

9) Use according to claim 7 characterized in that one employs “entangled” samples containing excited nuclei of at least one isomer nuclide, of which the gamma response is made up of a plurality of lines from which at least two lines are measured simultaneously, for example to improve the signal to noise ratio during the measurement carried on the “entangled” “slave” sample or on the “entangled” “slave” samples.

10) Use according to claim 7 characterized in that one employs a modulated stimulation in amplitude on at least one “entangled” “master” sample.

11) Use according to claim 7 characterized in that one employs a stimulation modulated in time on at least one “entangled” “master” sample.

12) Complex product according to claim 1 characterized in that a plurality of groups of “entangled” samples, each group of “entangled” samples constituting a product according to claim 1, are laid out in relation to each other on at least two supports, for example disks, called thereafter by convention “entangled” supports, for example by positioning an “entangled” sample of each group of “entangled” samples on each one of the aforesaid supports according to a defined order.

13) Device of implementation of the method according to claim 5 for the manufacture of the complex product according to claim 12 characterized in that it includes at least an apparatus of excitation irradiating together at least one group of samples, the group of samples to be entangled, containing nuclei of at least one isomer nuclide having at least one metastable state, by means of gamma rays at least partly entangled, for example generated, either by a source of gamma rays emitted in a cascade, or by a generator of

gamma rays coming from the Bremsstrahlung of accelerated particles, with a sufficient energy to excite the aforementioned nuclei of the isomer nuclide in at least one metastable state, at least two of the "entangled" samples, of at least one group of "entangled" samples, being distributed on two or several supports, the "entangled" supports, according to the optimization of the apparatus.

14) Device of implementation of the method of use according to claim of use 7 applied to the complex product according to claim 12 characterized in that it includes at least one of the following apparatuses, insofar as it is intended to implement whole or part of the method of use, object of the aforesaid claim of use, located within the place covered by this patent, including aircrafts, marine vessels, submarines and spacecrafts, and the terrestrial, marine and space probes:

- one or several apparatuses for modulated stimulation, applied to at least one of the "entangled" samples, the "entangled" "master" sample, of at least one the "entangled" supports, deexciting by X or gamma stimulation, one or several of the said "entangled" "masters" samples,
- one or several apparatuses of detection for measuring simultaneously with the action of at least one of the aforesaid apparatuses for stimulation, a gamma radiation coming from an additional modulated deexcitation on at least one characteristic line of a nuclide contained in at least one of the other "entangled" samples, the "slave", of at least one of the other "entangled" supports, and in that this additional measured modulated deexcitation, is used to determine the reception of at least one information or to activate at least one remote control coming from the apparatus of stimulation.

15) Device of implementation according to claim 13 for the manufacture of the complex product according to claim 12 characterized in that the "entangled" samples of one or more groups of "entangled" samples are laid out on at least two supports in the apparatus of irradiation, at least two of these supports, the "entangled" supports, being thereafter separated for the utilization.

16) Device of implementation according to claim 13 for the manufacture of the complex product according to claim 12 characterized in that one has only one support for the

groups of samples to be entangled, before their divisions, in the apparatus of irradiation, the said samples of each group, once entangled, being the subject of a division on at least two supports, the “entangled” supports.

17) Device of implementation according to claim 14 to exploit the complex product according to claim 12 characterized in that at least two of the aforementioned “entangled” supports are positioned in relation to each other, for example in synchronous relation, in the apparatus or apparatuses of modulated stimulation, and in the apparatus or the apparatuses of detection, in such way that on at least one “entangled” support, at least one “entangled” slave sample is measured by at least one apparatus of detection, when at least one “entangled” “master” sample of the same group of “entangled” samples located on one of the other “entangled” supports is stimulated in at least one apparatus of modulated stimulation.

18) Device of implementation according to claim 14 characterized in that groups of “entangled” samples are arranged according to a defined order allowing the transmission and the reception of complex messages.

19) Utilization according to claim 7 to remotely transmit information, in particular emergency signals, remote controls, data acquisition, in the mines, sea-beds in particular by means of robots and submarines, in drillings, in the space field in particular at very long distances.

20) Product according to anyone of claims 1, 2, 3 or 4 for medical use in order to irradiate an organ in which at least an “entangled” sample is laid out near or in the aforesaid organ, by causing a remote stimulation by means of at least one “entangled” sample.

21) Device of implementation of the method of use according to claim 7 for usage as a commercial kit of demonstration of whole or part of the method of use covered by the aforesaid claim.

STATEMENT UNDER ARTICLE 19

Claim 1 as filed, by grouping the steps of the method of preparation and exploitation of the intermediate product made of the "entangled" samples comprising entangled excited nuclei of at least one kind of isomer nuclide, and by positioning these steps in the not characterizing part of the claim, could induce in the mind of the reader a confusion of the step of excitation and step of deexcitation per stimulation which are of different types, and separated in time; the step of deexcitation being applied to only part of the "entangled" samples.

The claim of simple product 1 characterizes the intermediate product made up of "entangled" samples in which the typical property of the quantum mechanics of entanglement between excited nuclei of isomer nuclides was induced. This presentation allows to specify certain property of the aforesaid simple product, in particular its capacity to be able to be deexcited on a duration proportional to half-life of isomer nuclides which can reach 50 years, which constitutes a major advantage of industrial applicability compared to gas techniques macroscopically entangled and exploited by fluorescence, whose coherence is maintained only during approximately 1 millisecond, which does not make it possible for considering a useful transmission of information.

Claim 5 characterizes a manufacturing process of the product according to the claim 1, which teaches to the expert the means necessary and sufficient to implement the process for obtaining the aforesaid product, in particular the irradiation by means of gamma rays at least partly entangled of a sufficient energy to excite some of the nuclei of an isomer nuclide in at least a metastable state. This technique differs from the techniques usually used for obtaining excited isomer nuclides; these other techniques do not induce the typical property of entanglement between excited nuclei contained in separate samples.
Claim 7 characterizes a use of a simple product according to claim 1 to remotely control a deexcitation by employing the aforementioned “entangled” samples: it teaches to the expert the means necessary and sufficient to exploit the aforementioned “entangled” samples of the aforesaid product:

- by the step of modulated stimulation of the deexcitation of an “entangled” sample, qualified as “entangled” “master” sample, no measurement being required on the aforementioned “entangled” “master” sample,
- and by the step of measurement of an additional modulated deexcitation on another remote “entangled” sample, qualified as “entangled” “slave” sample, no stimulation of the deexcitation being required on the aforementioned “entangled” “slave” sample, measurement which makes it possible to determine a detection of information. This step of measurement can be replaced in other applications by the use of the supplement of radiation produced to induce a remote control, or by a use of the supplement of radiation produced to irradiate the environment of the aforesaid “entangled” “slave” sample.

To ensure the protection of certain devices of implementation of the invention, it is necessary to characterize the complex product made of “entangled” supports carrying a number of groups of “entangled” samples according to the claim of simple product 1. Indeed, the industrial devices of implementations of the invention for telecommunications will probably be developed on the basis of the aforesaid “entangled” supports, rather than for the manufacture and the exploitation of only one specimen of simple product.
The claim of complex product 12 characterizes the complex product made up of supports, named by convention “entangled” supports, made of the ad hoc positioning of a number of simple products according to claim 1.
The claim of device of implementation 13 characterizes the device for the implementation of the method according to claim 5 for the manufacture of the complex product according to claim 12. It teaches to the expert the means necessary and sufficient to produce the complex product according to claim 12.
The claim of device of implementation 14 characterizes the device for the implementation of the method of use according to claim 7 applied to the complex product according to claim 12. It teaches to the expert the means necessary and sufficient to transmit information between the apparatus of modulated stimulation and the apparatus of detection for the use of the aforesaid complex product. This device of implementation made of two types of apparatus, an apparatus of modulated stimulation of type “transmitter”, and a measuring apparatus of detection of type “receiver”, one being able to belong to a different territoriality, the protection is required for each type of apparatus.
A new claim 21 is added to protect a device of implementation forming a commercial kit of implementation for the use of the simple product according to claim 7.

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